

**IN THE CLAIMS**

Please amend the claims as follows. Any differences between the current state of the claims and the claims below are unintentional and in the nature of typographical errors.

1. (Previously Presented) A method, comprising:  
  
receiving a matrix comprising a first plurality of samples associated with a first signal and a second plurality of samples associated with a second signal, the second signal comprising a first portion associated with the first signal and a second portion associated with at least one disturbance;  
  
projecting the matrix into an orthogonal space; and  
  
using the projected matrix to at least partially isolate the first portion of the second signal from the second portion of the second signal;  
  
wherein the matrix comprises (i) a first column Hankel matrix comprising the first plurality of samples in a first portion of the matrix and (ii) a second column Hankel matrix comprising the second plurality of samples in a second portion of the matrix.

2. (Original) The method of Claim 1, wherein projecting the matrix comprises performing canonical QR-decomposition on the matrix, the canonical QR-decomposition creating an orthogonal matrix and an upper triangular matrix.

3. (Original) The method of Claim 2, wherein:  
  
the upper triangular matrix has a plurality of values along a diagonal of the matrix, each value being greater than or equal to zero; and  
  
the diagonal lies between an upper left corner and a lower right corner of the upper triangular matrix.
4. (Original) The method of Claim 1, wherein projecting the matrix comprises projecting the first signal along with the second signal.
5. (Currently Amended) The method of Claim 1, further comprising generating the matrix comprising the first and second plurality of samples.
6. (Previously Presented) The method of Claim 1, wherein:  
  
the first column Hankel matrix comprises a backward column Hankel matrix; and  
  
the second column Hankel matrix comprises a forward column Hankel matrix.
7. (Previously Presented) The method of Claim 1, wherein:  
  
the first column Hankel matrix comprises one of a backward column Hankel matrix and a forward column Hankel matrix; and  
  
the second column Hankel matrix comprises one of a backward column Hankel matrix and a forward column Hankel matrix.

8. (Original) The method of Claim 1, wherein the matrix comprises a first matrix, the first matrix containing a first segment of samples; and  
further comprising:

receiving a second matrix containing a second segment of samples;

concatenating the second matrix with an upper triangular matrix associated with the first matrix to form a concatenated matrix; and

projecting the concatenated matrix.

9. (Original) The method of Claim 8, wherein concatenating the second matrix with the upper triangular matrix comprises multiplying values in the upper triangular matrix by a forgetting factor.

10. (Previously Presented) The method of Claim 8, wherein the at least one disturbance comprises at least one of: white noise and colored noise.

11. (Currently Amended) An apparatus, comprising:

at least one memory ~~operable to~~ storing [[e]] a matrix comprising a first plurality of samples associated with a first signal and a second plurality of samples associated with a second signal, the second signal comprising a first portion associated with the first signal and a second portion associated with at least one disturbance; and

at least one processor ~~operable to~~:

performing canonical QR-decomposition on the matrix, the canonical QR-decomposition creating an orthogonal matrix and an upper triangular matrix, the upper triangular matrix having a plurality of values along a diagonal of the matrix, each value being greater than or equal to zero, the diagonal lying between an upper left corner and a lower right corner of the upper triangular matrix; and

using [[e]] the orthogonal matrix and the upper triangular matrix to at least partially isolate the first portion of the second signal from the second portion of the second signal;

wherein the matrix comprises (i) a first column Hankel matrix comprising the first plurality of samples in a first portion of the matrix and (ii) a second column Hankel matrix comprising the second plurality of samples in a second portion of the matrix.

12. (Previously Presented) The apparatus of Claim 11, wherein performing the canonical QR-decomposition allows the at least one processor to project the matrix into an orthogonal space so as to at least partially isolate the first portion of the second signal from the second portion of the second signal.

13. (Original) The apparatus of Claim 12, wherein the at least one processor is operable to generate a projection that includes the first signal, the first portion of the second signal, and the second portion of the second signal.

14. (Currently Amended) The apparatus of Claim 11, wherein the at least one processor is further operable to generate the matrix comprising the first and second plurality of samples.

15. (Previously Presented) The apparatus of Claim 11, wherein:  
the first column Hankel matrix comprises a backward column Hankel matrix; and  
the second column Hankel matrix comprises a forward column Hankel matrix.

16. (Original) The apparatus of Claim 11, wherein:  
the matrix comprises a first matrix, the first matrix containing a first segment of samples;  
and  
the at least one processor is further operable to:  
receive a second matrix containing a second segment of samples;  
concatenate the second matrix with an upper triangular matrix associated with the  
first matrix to form a concatenated matrix; and  
perform canonical QR-decomposition on the concatenated matrix.

17. (Original) The apparatus of Claim 16, wherein the at least one processor is  
further operable to multiply values in the upper triangular matrix by a forgetting factor.

18. (Currently Amended) A computer program embodied on a computer readable medium ~~and operable to be executed by a processor~~, the computer program comprising: ~~computer readable program code for:~~

computer readable program code for generating a matrix comprising a first plurality of samples associated with a first signal and a second plurality of samples associated with a second signal, the second signal comprising a first portion associated with the first signal and a second portion associated with at least one disturbance;

computer readable program code for decomposing the matrix so as to form a projection of the matrix in an orthogonal space; and

computer readable program code for using the projection to at least partially isolate the first portion of the second signal from the second portion of the second signal;

wherein the matrix comprises (i) a first column Hankel matrix comprising the first plurality of samples in a first portion of the matrix and (ii) a second column Hankel matrix comprising the second plurality of samples in a second portion of the matrix.

19. (Original) The computer program of Claim 18, wherein the computer readable program code for decomposing the matrix comprises computer readable program code for performing canonical QR-decomposition on the matrix, the canonical QR-decomposition creating an orthogonal matrix and an upper triangular matrix.

20. (Original) The computer program of Claim 19, wherein:  
the upper triangular matrix has a plurality of values along a diagonal of the matrix, each value being greater than or equal to zero; and  
the diagonal lies between an upper left corner and a lower right corner of the upper triangular matrix.

21. (Original) The computer program of Claim 18, wherein the projection of the matrix comprises a projection of the first signal, the first portion of the second signal, and the second portion of the second signal.

22. (Previously Presented) The computer program of Claim 18, wherein:  
the first column Hankel matrix comprises a forward column Hankel matrix; and  
the second column Hankel matrix comprises a backward column Hankel matrix.

23. (Previously Presented) The computer program of Claim 18, wherein:  
the first column Hankel matrix comprises a backward column Hankel matrix; and  
the second column Hankel matrix comprises a forward column Hankel matrix.

24. (Original) The computer program of Claim 18, wherein the matrix comprises a first matrix, the first matrix containing a first segment of samples; and further comprising computer readable program code for:

- receiving a second matrix containing a second segment of samples;
- concatenating the second matrix with an upper triangular matrix associated with the first matrix to form a concatenated matrix; and
- decomposing the concatenated matrix so as to form a projection of the concatenated matrix.

25. (Original) The computer program of Claim 24, wherein the computer readable program code for concatenating the second matrix with the upper triangular matrix comprises computer readable program code for multiplying values in the upper triangular matrix by a forgetting factor.

26. (Previously Presented) A system, comprising:

a monitored system operable to receive a first signal and provide a second signal, the second signal comprising a first portion associated with the first signal and a second portion associated with at least one disturbance; and

a controller operable to:

produce a matrix comprising a first plurality of samples associated with the first signal and a second plurality of samples associated with the second signal;

decompose the matrix so as to form a projection in an orthogonal space; and

use the projection to at least partially isolate the first portion of the second signal from the second portion of the second signal;

wherein the matrix comprises (i) a first column Hankel matrix comprising the first plurality of samples in a first portion of the matrix and (ii) a second column Hankel matrix comprising the second plurality of samples in a second portion of the matrix.

27. (Previously Presented) A method, comprising:  
performing canonical QR-decomposition on a matrix, the canonical QR-decomposition creating an orthogonal matrix and an upper triangular matrix; and  
using the orthogonal matrix and the upper triangular matrix to at least partially isolate one or more effects of one or more disturbances in a signal;  
wherein the upper triangular matrix has a plurality of values along a diagonal of the upper triangular matrix, each value being greater than or equal to zero, the diagonal lying between an upper left corner and a lower right corner of the upper triangular matrix; and  
wherein the matrix comprises a first column Hankel matrix in a first portion of the matrix and a second column Hankel matrix in a second portion of the matrix.